External review of Roots, Tubers and Bananas for food security and income

General Comments:

I had the privilege of reviewing the concept paper for this mega-program, and I was quite critical, despite being strongly favourable to increased investments in roots, tubers and bananas (RTBs). It was very gratifying to see the vastly improved quality of this full proposal, and I feel that most of my initial concerns have been addressed. I will not expound on the multiple strengths of the current proposal – overall it makes a strong case for investment and definitely merits approval.

There are several areas where I feel the mega-program could be further strengthened, and I will provide more details below: 1. More explicit strategy to reposition RTBs within the development agenda including driving more accurate data on their actual production and consumption. 2. A more robust discussion of what role genetic modification is likely to play in the future of RTBs and how this mega-program will prepare the way. 3. An even more robust gender strategy which looks not just at how to involve women and how to mitigate negative consequences, but seizes the opportunities of RTB crops to empower women. 4. Further reflection on what strategies and partnerships can be leveraged to further advance the implementation science portion of the mega-program. 5. More focus on the post-harvest technologies which will have an immediate impact on producer/consumer households by decreasing losses and making product available over a longer period of the year, and that includes these households in prioritization. 6. A more explicit discussion of how decision-making will be balanced between potentially competing priorities – for example, between reaching the largest number of end-users by focusing on fewer, more commonly grown/used crops versus having an impact on smaller, but marginalized populations through focus on niche crops; between breeding for nutrition traits versus other valued traits. 7. A governance and management structure that has a more robust role (or at least a role) for non-CGIAR partners. The current description really is doing business as usual, and does not reflect at all on the governance and management levels the substantial role for partners that is described in the rest of the proposals.

CRITERIA FOR REVIEWING MEGA PROGRAM PROPOSALS
Reviewers are asked to address the following overall criteria in their assessment of the proposals.

1. Strategic coherence and clarity of Program objectives

There is a strong coherence and clarity in the program objectives. However, there is a stream of work throughout the proposal that may benefit from becoming a specific program objective – that of repositioning RTBs in the development agenda. The data on production and consumption that used in the justification come largely from FAOSTAT. There are multiple examples of the weaknesses of this data set, particularly when it comes to RTBs which are generally not considered primary staples nor cash crops (the proposal acknowledges this on page 90 “Owing to the lack of reliable production data for some of the crops ...”). These weaknesses often lead to a major under-estimation of the true importance (and the true potential) of these crops. This is somewhat addressed in 7.1.1 but only for selected areas. For the program of research presented here to truly have desired level of impact there will have to be significantly more financial and human resource priorities given to RTBs by national governments and development partners. There should be a more explicit, overarching advocacy objective that would include increasing reliability of RTB data being generated by national systems, enhancing decision

makers' understanding of the role of RTBs, and leveraging new investments (from national governments, donors and other development partners, including the private sector). This should be included in the monitoring and evaluation framework (i.e. tracking of changes in policies and investments). This would have an impact on the scope of work and profile of the communications officer proposed in the project management unit (page 121).

I am concerned that genetic modification, potential and obstacles, has not been given due thought. I refer to several phrases on page 40: "Genetic modification (GM) approaches are particularly important for RTB as they represent virtually the only means of adding or silencing a specific gene(s) to improve the phenotype of an accepted variety whose constitution could not be recovered by conventional breeding due to its inherent heterozygosity. Genetic transformation is also important for the introduction of traits not present in RTB gene pools." "There are many problems in RTB that have not been overcome through conventional technologies; GM will allow for breakthroughs." "The relative low interest of the large GM companies in RTB allows the public sector to access key proprietary technologies associated with GM approaches for global RTB uses." These statements lead the reviewer to think that GM may result in game-changing technological breakthroughs having very profound impacts on this mega-program and the RTB field in general. However, other than the three intriguing paragraphs on GM, there is very little other discussion of the potential impact of these technologies, the obstacles that may be confronted and how the mega-program will (or will not) address them. The mega-program should make an effort to predict the trend of GM in RTBs and more robustly address how it will respond to the changes in the technological landscape and position countries and regions to be able to seize opportunities offered by GM. I realize this is an area fraught with ideological landmines, however, that is even more a reason that the CGIAR system should play a strong evidence-based 'honest broker' role. Evidence-based advocacy for decision-making around GM crops could be part of the over-arching repositioning objective I suggest above. The communications officer proposed on the project management unit needs to be well-versed in issues around GM crops.

2. Delivery focus and plausibility of impact

In general the impact pathways for each of the themes are well conceived and plausible. Of particular concern during my review of the concept paper was delivery of technologies to end-users (now in theme 4). There have been major improvements in this section. The phrase "Currently, more than 95% of RTB planting material used by small farmers originates from the farmer's own field or the field of a neighbor, ..." (page 68 of the proposal) underscores the critical nature of this theme in actually achieving impact on end-users. Given the long-standing challenge, and the relatively modest track record of CGIAR Centers and national agriculture research and extension systems (NARESs) of effectively addressing it, the mega-program should explore partnerships with agencies having specific expertise in technology dissemination, not necessarily in the agricultural sector. It is not clear that the traditional CGIAR partnerships alone (which are heavily reliant on NARESs, and continue to be in this proposal) will be able to make the necessary breakthroughs. The proposal states that "We will take advantage of institutions that have a demonstrated ability to eliminate bottlenecks in delivery of new technologies to poor populations and, in particular, to women farmers" (page 17). Examples of such institutions and how they will be used should be provided.

In theme 6, the focus of post-harvest technologies seems to be mainly on linking to value chains and market opportunities, and the prioritization of research does not adequately take into consideration consultation with end users themselves. As the proposal recognizes, there is an especially strong overlap between producers and consumers for RTB crops, and relatively minor post-harvest improvements that

put more food into the hands of households, or extend the period of availability, for the same amount of labor and other inputs can be quick wins for improving food security, nutrition and livelihoods. For example, user-friendly systems for storing fresh sweetpotato root would significantly increase sweetpotato's contribution to household's diet and even out surges in availability (allowing them to serve as 'food banks'). This would also improve income-generation potential as it would allow sales at relatively higher prices over an extended period of time, versus having a glut of the product on the market during a short period that drives down prices.

Achieving the nutritional objectives of this mega-program is heavily reliant on theme 2 being able to deliver nutritionally improved varieties (as illustrated in table 4.2.1 on pages 34 and 35). The ability of orange-fleshed sweetpotato (OFSP) to deliver vitamin A is now well documented. The mega-program is also seeking to deliver significant amounts of carotenoids through bananas, cassava and yam; and zinc and iron through potato. There should be more discussion of the feasibility and timeline of getting nutrient levels in these crops up to targets that have the potential for public health impact. With the information presented it is very difficult to assess how likely it is that these four RTBs will have a significant population-based impact on vitamin and mineral deficiencies.

Related to this is more explicit discussion of how priorities will be balanced when they are competing. For example, if traits desired for commercialization of a crop are not compatible with traits that are nutritionally desirable, which traits will be prioritized in breeding programs.

A similar question about prioritization arises by inclusion of Andean root and tuber crops (ARTC) and the aroids. In a resource constrained environment, how will prioritization take place between investments in major RTB crops that may have positive impacts on a wider population and investments in these minor crops, which may have significant impacts, but only in small populations.

3. Quality of science

Overall the proposal builds on a robust review of the literature and is promoting scientific rigor. I have already expressed a concern about the variable quality of the data in FAOSTAT which is used as the source for projecting current levels of production of the RTB crops and the potential impact of the mega-program. As discussed above, I recommend that the mega-program more robustly address improving data quality around these crops as an essential step in repositioning them on the development agenda.

I have also discussed above my concerns about the feasibility of making significant improvements in micronutrient quality of the RTB crops other than sweetpotato. The HarvestPlus program has undertaken rigorous assessment of the likelihood and timelines of meeting nutrient targets for different crops. A similar exercise should be undertaken for these RTB crops so that realistic nutrition objectives can be set.

4. Quality of research and development partners and partnership management

There is an impressive array of partnerships, and in general they seem to have been put together with a great deal of thought. I have noted above my concern that more thought should be given to innovative partnerships with agencies that have expertise in technology dissemination in theme 4. If there is not adequate gender expertise within the CGIAR and non-CGIAR partners, the partnership may need to be expanded to bring that on board (discussed more below). It is not clear from the proposal what volume

of financial resources will be made available to partners to undertake work. Budget table 8.1 (page 126) indicates 8.6% of the budget being allocated to theme 7 (enhancing impact through partnerships), which would appear to be far too low if non-CGIAR partners are to be given serious roles in this mega-program and if expected impacts are to be achieved. While there is some bold new thinking in this proposal, the relationship with partners does tend to remain quite CGIAR-centric (as is particularly evidenced by the management and governance structures – points to be addressed below). For example, it appears that partners can only participate in the management committee, if at all, if they "buy" a place at the table ("... and the additional resources they would bring to the CRP." page 119).

5. Appropriateness and efficiency of Program management

Overall the proposed management committee (MC) and program management unit are robust. The management committee represents very high-level engagement by the participating CGIAR centers and there are dedicated resources in the program management unit.

The most striking omission in the program management is the marginalizing of the role of non-CGIAR partners which is quite contrary to the robust role assigned to partners throughout the rest of the proposal. For a mega-program that is so reliant on effective partnerships to achieve impacts, it seems imperative to give a more significant role to non-CGIAR partners in the program management and in resource allocations (as well as in governance, to be addressed below). The suggestion that "external MC members could be appointed from major partner institutions ...." (page 119) is hardly a rallying call for a new way of doing business with partners, and it appears this would only be a possibility if the "external MC members" pay their own way. There seems to be a fundamental contradiction here, as the mega-program proposal recognizes that partnerships are essential to achieve the objectives, but is not looking to provide resources to partners to participate meaningfully but only allows them a place at the table if they are in effect subsidizing the mega-program. It is not clear that non-CGIAR partners can have any role on theme teams and theme leaders are explicitly only from the four participating CGIAR centers.

The program management unit seems to be well conceived in general. I have made comments above that would have an impact on the profile and scope of work of the communications officer. One notable absence is a dedicated monitoring and evaluation position. The monitoring and evaluation component of the proposal is only briefly sketched out, although it is recognized that "The M&E system will be a crucial tool for the PD, the MC, and stakeholders to track progress and take corrective action, and for reporting." (page 123). It is recommended that there be at least one dedicated monitoring and evaluation position in the program management unit (this may be the major role of "one high-level research officer", although it is not mentioned. If so, this needs to be more explicit.

As discussed below, gender has been far more robustly addressed in the proposal than in the concept paper and there is a commitment to mainstreaming a gender strategy. However, there is not demonstration of the expertise in gender within the overall mega-program team. The management committee is tasked to "Guarantee .... that a coherent gender strategy is articulated and successfully implemented.", however it is not clear who has the expertise to do so and is tasked to do so. If there is not adequate gender expertise in the overall mega-program team, then a position may be required in the program management unit to drive the gender strategy.

6. Clear accountability and financial soundness, and efficiency of governance

I have already noted concern about the relatively modest budget allocation to theme 7. I am also concerned about the relatively low allocation to theme 4 "Making available low-cost, high-quality planting material for farmers" (9.6% of the budget) when this is such an essential ingredient for having any impact for end-users.

The primary crop expertise is clear for potato, sweetpotato, yam, the androids and the ARTCs. However, for banana there are three centers with primary crop expertise and for cassava there are two. It should be explained how crop-specific research will be coordinated/optimized across centers when more than one center has primary expertise, and which center is accountable for crop-specific breeding objectives.

I am concerned that non-CGIAR partners potentially have no say in governance (and if so, only later on in the life of the mega-program and not at all in the early formative years). The steering committee is composed of CGIAR representatives ".... with the possibility of two independent members ..." page 118. Even this 'possibility' of two independent members is conditioned: "The independent members should have a vested interest in RTB but they should not be implementing partners to avoid potential conflicts of interest." It is odd that the CGIAR-related members of the steering committee are not deemed to have any potential conflicts of interest whereas this is an explicit concern for non-CGIAR members. The governance structure as conceived is likely to promote a very CGIAR-centric view of the mega-program, and does not represent a new way of doing business.

Other comments:

There has been a major improvement in discussion of gender throughout the proposal. The proposal states that it "Integrates a gender strategy that is mainstreamed and based on audits/research to identify needs and strategies for ensuring equity in access, participation and benefits." (page 1). Given how central women are to production of most RTB crops, I would encourage the mega-program to be even more pro-active and undertake research to see how RTB crops can be leveraged to truly empower women farmers. As discussed above, while there is much discussion about the need to mainstream gender, there is not a demonstration that the expertise to do see is resident within the CGIAR centers involved nor the partners. This needs to be clarified, and if additional gender expertise is required then a position should be created within the program management unit (or brought on board through one of the partners – CGIAR or non-CGIAR).

I would recommend that theme 2 be re-named to explicitly include "added nutritional and commercial value". This comes out in the text, but should be raised to the title level, so that the focus is not lost.

I find the statement "Currently, most efforts focus on supplements and food fortification. However, these approaches are limited by lack of infrastructure, logistical support, and regular financial disbursements by Ministries of Health. As a result, most nutritionists now consider diversifying the diet and increasing the micronutrient content of staple crops grown in developing countries (biofortification) to be a low-cost, sustainable way to reach people with poor access to health-care systems and/or formal markets." (Table 4.7.4) to be somewhat inappropriate. I do not think that dietary diversification/biofortification strategies should be positioned as in competition with supplementation and food fortification, but rather as being complementary to other nutrition interventions.